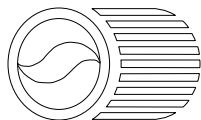


Low Carbon Fuel Standard Policy and Regulatory Development Working Group Meeting

November 16, 2007

California Environmental Protection Agency









Air Resources Board






Tentative Schedule

Task Name	Nov 11, '07							Nov 18, '07						
	M	T	W	T	F	S		S	M	T	W	T	F	S
<input type="checkbox"/> WG3 Session 1: Nov. 16, 2007														
Scope of LCFS														
Diesel fuel														
Drive train efficiency adjustment factor														
Baseline														
Targets														
Upstream emission (crude oil)														
Banking and trading of credits														

Task Name	Dec 16, '07							Dec 23, '07						
	S	S	M	T	W	T	F	S	S	M	T	W	T	F
<input type="checkbox"/> WG3 Session 2: Dec. 20, 2007														
Land use change														
Default values														
Boundaries and compliance paths														
Dealing with uncertainty in lifecycle analysis														
Point of regulation														
Compliance, certification, auditing, and penalties														

Tentative Schedule (con't)

Task Name	Jan 13, '08							Jan 20, '08							
	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
<input type="checkbox"/> WG3 Session 3: Jan.17, 2008															
Interaction with AB1493, AB32, and other policy instruments															
Upstream emissions (refineries)															
Innovation credits, CCS, offsets, and opt-ins															
Environmental justice and sustainability															
Cost analysis															

Task Name	Feb 17, '08							Feb 24, '08									
	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
<input type="checkbox"/> WG3 Session 4: Feb. 21, 2008																	
Additional topics and program review																	
<input type="checkbox"/> Stakeholder suggested topics																	
Infrastructure, biofuel availability, and distribution																	
Technology timing																	

Agenda

- WG3: Session 1 list of policy issues
 1. Scope of standard
 2. Diesel fuel and drivetrain efficiency adjustment factor
 3. Upstream emission – crude oil
 4. Baseline
 5. Targets
 6. Banking and trading of credits
- Stakeholder presentations
- Future meeting dates

1. Scope of LCFS

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Option 1 (UC Recommendation):

Apply to all gasoline and diesel used for transportation in CA; non-liquid fuels (electricity, natural gas, propane, and hydrogen) to voluntarily opt-in; exclude aviation and bunker fuel

- Advantages:
 - Electricity, CNG, LPG, and H₂ can generate credits
 - Electricity: Provide time for developing learnings
- Disadvantages:
 - Difficulty to distinguish electricity used for transportation from other uses; potential overlap with other policies

1.Scope of LCFS

Option 2 (Staff Recommendation):

Apply to all gasoline, diesel, natural gas, propane, and electricity; hydrogen opt-in; exclude aviation and bunker fuel

- Advantages:
 - CNG and LPG fleets are in place
 - Electricity and hydrogen can help generate credits
- Disadvantages:
 - Similar problems with electricity as Option 1

1. Scope of LCFS

Option 3:

**LCFS apply to all fuels in CA used for transportation;
exclude aviation and bunker fuel**

- Advantages:
 - All fuel-vehicle pathways used needed to achieve 2020 target
 - Electricity and hydrogen can generate significant credits
- Disadvantages:
 - Large scope may be challenging to administrate
 - Inclusion of electricity may create the complexity of overlapping with other policies - double counting

1. Scope of LCFS

Summary:

Option 1 (UC Recommendation):

- Apply to all gasoline and diesel used for transportation in CA; non-liquid fuels (electricity, natural gas, propane, and hydrogen) to voluntarily opt-in; exclude aviation and bunker fuel

Option 2 (Staff Recommendation):

- Apply to all gasoline, diesel, natural gas, propane, and electricity; hydrogen opt-in; exclude aviation and bunker fuel

Option 3:

- LCFS apply to all fuels in CA used for transportation, excluding aviation and bunker fuel

2. Diesel Fuel and Drivetrain Efficiency Adjustment Factor

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Option 1:

Ignore differences in efficiencies between gasoline and diesel drivetrains

- a) Pool diesel and gasoline to create single AFCl baseline of 92 gCO₂e/MJ (and a single target)
 - **Advantages**: Would encourage the sales of diesel fuel and vehicles
 - **Disadvantages**: Potential higher local diesel-related air pollution and effects, environmental justice impacts

- b) **(Staff Recommendation)**: Treat gasoline and diesel separately with 2 separate baselines and targets carbon intensity of 10% reduction each
 - **Advantage**: Avoid the problem of expected increases in diesel fuel sales and diesel related effects; promote development of alternative fuels; no overlap with AB1493
 - **Disadvantage**: Added complexity, reduce flexibility

2. Diesel Fuel and Drivetrain Efficiency Adjustment Factor

Option 2 (UC Recommendation):

Adjust diesel's carbon intensity using an adjustment factor to reflect drivetrain efficiency differences

- a) **Treat all diesel fuel sales the same and apply the same diesel adjustment factor**
- **Advantages:** Appropriately reflect differences between light duty vehicles powered by gasoline or diesel
 - **Disadvantages:** Lead to problems of allowing compliance through increased sales of heavy duty diesel fuels; double credit used for AB 1493 compliance; issues of changes in future efficiencies
- b) **Treat heavy and light duty diesel differently:**
- Heavy duty diesel: un-adjusted AFCL of 91 gCO₂e/MJ
 - Light duty diesel: adjusted AFCL of 71 gCO₂e/MJ)
 - **Advantages:** Retain incentive to displace gasoline use with light duty diesel
 - **Disadvantages:** Distinguishing between light and heavy duty diesel sales will be challenging; AB 1493 issues

2. Diesel Fuel and Drivetrain Efficiency Adjustment Factor

Option 3 (UC Recommendation):

Target gasoline only; diesel and other fuels opt-in;
increase the AFCl intensity target for gasoline to above
10% (target ~12.4%)

- **Advantages:**
 - Simplicity
 - At 12.4% gasoline AFCl target for gasoline, there could be incentive to reduce the carbon content of other fuels
- **Disadvantages:**
 - Diesel and other petroleum fuels have no target carbon intensity; potential to reduce innovation for other fuels

2. Diesel Fuel: Summary

Option 1:

- Ignore differences in efficiencies between gasoline and diesel drivetrains
 - a) Single AFCl baseline of 92 gCO₂e/MJ
 - b) **(Staff Recommendation):** Separately treat gasoline and diesel; 10% reduction each

Option 2 (UC Recommendation):

- Adjust diesel's carbon intensity using an adjustment factor to reflect drivetrain efficiency differences
 - a) Treat all diesel fuel sales the same and apply adjustment factor
 - b) Treat heavy and light duty diesel differently:
HDV= 91 gCO₂e/MJ, LDV= 71 gCO₂e/MJ

Option 3 (UC Recommendation):

- Use gasoline sales as compliance tool, with diesel opt-in; increase AFCl intensity target for gasoline to ~12.4%

3. Upstream Emissions: Crude Oil

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Option 1:

Using a fixed, average value across all crude oil types

- Advantages:
 - Fixed upstream value is much simpler
 - May reduce rationalization
- Disadvantages:
 - Less accurate accounting
 - Ignore carbon footprint of heavier crudes
 - No incentive for innovations
 - Will need to consider existing and future crude mix

3. Upstream Emission: Crude Oil

Option 2. (UC Recommendation):

For each type of crude, conduct full GHG lifecycle analysis

- Categorize fuel inputs and conduct full LCA
- Default values could be set for gasoline from conventional crude, heavy oil, tar sands, coal

■ Advantages:

- More accurately assess the total emission impacts of crudes
- Create additional incentives to monitor and reduce GHG emissions through credit for over-compliance
- Use conventional crude as baseline, encourage opt-ins for firms that can demonstrate better values

■ Disadvantages:

- Promote rationalization and related increases in GHG emissions with higher costs
- More calculation intensive; potential uncertainties

3. Upstream Emission: Crude Oil

Option 3: (Staff Recommendation):

Using a fixed, average value for conventional crude oil; non-conventional heavy crudes (tar sand, oil shale, coal to liquid, gas to liquid, other heavy oils) treated separately

- Advantages:
 - Retains simplicity of Option 1
 - Account for carbon footprint of conventional heavier crude oil
 - Reduced rationalization for conventional crudes
- Disadvantages:
 - May promote rationalization for un-conventional crudes

3. Upstream Emission: Crude Oil

Summary:

Option 1:

- Using a fixed, average value across all crude oil types

Option 2. (UC Recommendation):

- For each type of crude, conduct full GHG lifecycle analysis

Option 3: (Staff Recommendation):

- Using a fixed, average value for conventional crude oil; non-conventional heavy crudes (tar sand, oil shale, coal to liquid, gas to liquid, other heavy oils) treated separately

4. Baseline

4. Baseline

Option 1 (Staff Recommendation):

A uniform state-wide baseline should be applied; baseline year is the most recent year for which data are available before the LCFS was announced; use 2006 data

- Advantages:
 - A single value is easier to develop and maintain; 2006 data are available
- Disadvantages:
 - A single state-wide baseline is harder for some regulated entities to meet than others
 - Wider range of compliance costs for different firms

4. Baseline

Option 2:

Firm specific or facility specific carbon intensity baseline

- Advantages:
 - Reduce differences associated with different firms meeting a single baseline
- Disadvantages:
 - Early GHG emission reductions penalized; signal to firms anticipating possible future regulation not to risk good environmental behavior
 - Complexity in defining individual baselines
 - Firm-level targets may not necessarily result in 10% reduction in total carbon intensity

4. Baseline

Summary:

Option 1 (Staff Recommendation):

A uniform state-wide baseline should be applied; baseline year is the most recent year for which data are available before the LCFS was announced; use 2006 data

Option 2:

- Firm specific or facility specific carbon intensity baseline

5. Targets

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Option 1 (UC Recommendation):

Provider of transportation fuels regulated by or participating in LCFS should be held to the same standard; target value for transportation fuels = 83 CO₂e/MJ* in 2020

- Advantages:
 - Single target accurately reflects saving in carbon intensity when switching fuels
- Disadvantages:
 - Reduce technology innovations for fuels that already meet or exceed target; issues of diesel

* Relative to weighted AFCl of gasoline for baseline year of 2004. See UC Report Part I, Table 2-1.

5. Targets

Option 2:

Obtain 10% reduction for each fuel

- Advantages:
 - Reduction in each fuel could promote technology innovations for each fuel and reduce carbon intensities across all fuels
- Disadvantages:
 - Does not accurately reflect inherent reduction in carbon intensity by some fuels
 - Inhibit promotion of cleaner technologies

5. Targets

Option 3 (Staff Recommendation):

10% reduction for gasoline and diesel; non-gasoline fuels (i.e. CNG, LNG, electricity, others) will be compared to gasoline; compliance is met and credit will be awarded for reductions beyond 10% reduction relative to gasoline

- Advantages:
 - Promotes use of alternative/low carbon density fuels
 - Stimulate technological innovation
- Disadvantages:
 - Individual considerations needed for non-gasoline fuels
 - Administratively more challenging than option 1

5. Targets

Summary:

Option 1 (UC Recommendation):

- Provider of transportation fuels regulated by or participating in LCFS should be held to the same standard; target value for all transportation fuel = 83 CO₂e/MJ* in 2020

Option 2:

- Obtain 10% reduction for each fuel or firm

Option 3 (Staff Recommendation):

- 10% reduction for gasoline and diesel; non-gasoline fuels (i.e. CNG, LNG, electricity, others) will be compared to gasoline; compliance is met and credit will be awarded for reductions beyond 10% reduction relative to gasoline

6. Banking and Trading of Credits

6. Banking and Trading of Credits

Option 1: (UC Recommendation):

No limit on the ability of any legal entity to trade or bank LCFS credits; borrowing not allowed; not allowed for AB32 compliance; regulators serve as record keepers only; buyers and seller do not communicate price of allowance to the regulators; allow voluntary emissions reductions by retiring the credit

- Advantages:
 - Trading and banking of credits are important LCFS design elements
- Disadvantages:
 - Potential for errors, disputes, and fraud in their handling is possible
 - Allowance market are not regulated by the securities or commodities commissions

6. Banking and Trading of Credits

Option 2 (Staff Recommendation):

Similar to Option 1 but allow export of LCFS credit to AB32 but not vice versa

- Advantages:
 - Allows innovation and multiple markets for resultant credits
 - All generated credits will be used
 - Increases potential for technological innovation
- Disadvantages:
 - Smaller pool of LCFS credits

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Option 1: (UC Recommendation):

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Option 2 (Staff Recommendation):

- Similar to Option 1 but allow export of LCFS credit to AB32 but not vice versa

Tentative Future Meetings

- Proposed future meeting dates:
 - December 20, 2007 (Thursday)
 - January 17, 2008 (Thursday)
 - February 21, 2008 (Thursday)
 - All meetings located in CR550 at ARB
- Additional meeting information TBD

Thank You

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- Visit our website at:

<http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>